

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	M129468A Lg Tank	Client:	Alaskan Copper Works
Date Received:	12/22/11	Project:	% Acid, M129468, F&BI 112331
Date Extracted:	12/29/11	Lab ID:	112331-01 x10 and 112331-01 x100
Date Analyzed:	12/29/11	Data File:	112331-01 x10.025 and 112331-01 x100.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	102	60	125
Indium	86	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	22,400
Iron Screen	289,000
Nickel	9,370
Copper	3,820
Zinc	443
Arsenic	49.1
Silver	<10
Cadmium	27.9
Lead	116

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	M129468B Sm Tank	Client:	Alaskan Copper Works
Date Received:	12/22/11	Project:	% Acid, M129468, F&BI 112331
Date Extracted:	12/29/11	Lab ID:	112331-02 x100
Date Analyzed:	12/29/11	Data File:	112331-02 x100.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	83	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	106,000
Iron Screen	1,440,000
Nickel	108,000
Copper	14,700
Zinc	256
Arsenic	129
Silver	<100
Cadmium	<100
Lead	169

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Alaskan Copper Works
Date Received:	Not Applicable	Project:	% Acid, M129468, F&BI 112331
Date Extracted:	12/28/11	Lab ID:	I1-864 mb
Date Analyzed:	12/29/11	Data File:	I1-864 mb.016
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	86	60	125
Indium	89	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Iron Screen	<250
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Silver	<1
Cadmium	<1
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/03/12
Date Received: 12/22/11
Project: % Acid, M129468, F&BI 112331
Date Extracted: NA
Date Analyzed: 12/29/11

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR SPECIFIC GRAVITY
@ 15.56 °C**

<u>Sample ID</u> Laboratory ID	<u>Specific Gravity</u>
M129468A Lg Tank 112331-01	1.06
M129468B Sm Tank 112331-02	1.07

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/03/12
Date Received: 12/22/11
Project: % Acid, M129468, F&BI 112331
Date Extracted: NA
Date Analyzed: 12/29/11

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR PERCENT ACID BY VOLUME**

<u>Sample ID</u> Laboratory ID	<u>Percent Acid</u>
M129468A Lg Tank 112331-01	4.7
M129468B Sm Tank 112331-02	5.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/03/12

Date Received: 12/22/11

Project: % Acid, M129468, F&BI 112331

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 112301-39 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	8.87	105 b	105 b	67-132	0 b
Nickel	ug/L (ppb)	20	7.61	95 b	94 b	73-119	1 b
Copper	ug/L (ppb)	20	8.40	92 b	94 b	50-144	2 b
Zinc	ug/L (ppb)	50	16.1	95 b	96 b	46-148	1 b
Arsenic	ug/L (ppb)	10	2.78	107 b	107 b	56-167	0 b
Silver	ug/L (ppb)	5	<1	94	95	66-121	1
Cadmium	ug/L (ppb)	5	<1	104	101	86-118	3
Lead	ug/L (ppb)	10	4.60	101 b	100 b	76-125	1 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	100	66-135
Nickel	ug/L (ppb)	20	98	67-134
Copper	ug/L (ppb)	20	97	66-134
Zinc	ug/L (ppb)	50	99	57-135
Arsenic	ug/L (ppb)	10	99	55-128
Silver	ug/L (ppb)	5	96	64-136
Cadmium	ug/L (ppb)	5	98	66-135
Lead	ug/L (ppb)	10	100	67-135

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ENVIRONMENTAL CHEMISTS

Date of Report: 01/03/12

Date Received: 12/22/11

Project: % Acid, M129468, F&BI 112331

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR SPECIFIC GRAVITY
@ 15.56 °C**

Laboratory Code: 112331-02 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Specific Gravity	1.07	1.07	0	0-2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/03/12

Date Received: 12/22/11

Project: % Acid, M129468, F&BI 112331

**QUALITY ASSURANCE RESULTS
FROM THE ANALYSIS OF WATER SAMPLES
FOR PERCENT ACID**

Laboratory Code 112331-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Percent Acid	4.7	4.7	0	0-20

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Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

112331

SAMPLE CHAIN OF CUSTODY

ME 12/22/11

A-14

Send Report To Gerard ThompsonCompany ALASKAN Copper WorksAddress 628 S. Harbor StCity, State, ZIP Seattle WA 98134Phone # 206-571-6033 Fax # 206-382-4369SAMPLER'S (signature) [Signature]Page # 1 of 1

TURNAROUND TIME

☐ Standard (2 Weeks)☒ RUSH 9 day

Rush charges authorized by: _____

PROJECT NAME/NO.

PO #

% of Ac2M129468

REMARKS

SAMPLE DISPOSAL

☐ Dispose after 30 days☐ Return samples☐ Will call with instructions

ANALYSES REQUESTED

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	PTX by 8021B	VOCs by 8203	SVOCs by 8279	NFS	% of Ac2	Spec. Gravity	Ag-Ar-Cl	CR-Cu-Fe	Pb-Mn-Zn	Notes
M129468A lg tank	01	12/22/11	12:15	HNO3	1							X	X	X	X	X	
M129468B Sm tank	02	12/22/11	12:15	HNO3	1							X	X	X	X	X	

Princeton & Briggs, Inc.
3012 16th Avenue West
Seattle, WA 98119-3029
Ph. (206) 225-8882
Fax (206) 222-8844

FORM-CCOC-DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	<u>Gerard Thompson</u>	<u>ACW</u>	<u>12/22/11</u>	<u>1:18 PM</u>
Received by: <u>[Signature]</u>	<u>Nhan Phan</u>	<u>FeBI</u>	<u>12/22/11</u>	<u>1:18</u>
Relinquished by: _____				
Received by: _____				

Samples received at 13 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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e-mail: fbi@isomedia.com

January 3, 2012

Gerald Thompson, Project Manager
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on December 22, 2011 from the % Acid, M129468, F&BI 112331 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
ACU0103R.DOC